

Pension Reform in Slovakia

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Abstract

This paper presents the main features of the pension reform approved in 2003 in Slovakia. It evaluates adopted measures according to (1) motivation to pay social contributions, (2) guarantees of financial stability, (3) transition costs and (4) ability to provide adequate pensions. It shows that the reform has positive motivation effects and increases systems' overall stability through the risk diversification between labor and capital markets. In the following decade, prolonging of retirement age should secure system's financial stability. Later on, demography crisis might reveal too high generosity and un-sustainability of the "Pay-As-You-Go" (PAYG) pillar. Allowing for capital transfers, a new mandatory "Fully-Funded" (FF) pillar moderates these threats. However, the rule that binds at least 50% of investment portfolio to Slovak securities dilutes its strengths considerably. Together with the need to finance transition costs and with the uncertain capital markets' development, these are the main risks marking the reform proposal. To secure long-term financial stability, another reform of the PAYG including further prolonging of retirement age and/or change in the pension formula would be necessary. The recommendations are to introduce the automatic stabilizers (i.e. automatic parametric reforms of the PAYG), to shift further towards the "Defined-Contribution" PAYG plans and to decrease or abolish 50% investment restriction in the FF pillar.

Keywords: pension reform, social security, Slovakia

Introduction

The individual is able to smooth his lifetime consumption by saving some of the income during his working years and contributing it to a pension scheme, instead of consuming everything. Such redistribution over time contributes to preventing old-age poverty. There are two ways (Barr, 1998) of obtaining a claim on future output, either by **saving** a stock of money (fully-funded or FF scheme), or by **social insurance**, i.e. purchasing a promise of a share on future production (un-funded; pay-as-you-go or PAYG scheme). In the funded scheme the workers save part of their income and accumulate these savings in order to use them after retirement. The PAYG scheme is based on an intergenerational exchange, when current workers insure themselves by

paying out current pensioners and thus “buying” a promise to be paid later in their retirement age by the young generation.

Different countries have a broad variety of pension systems relying on the PAYG or the FF schemes or the combination of both. Traditionally, the continental Europe has its mandatory pension plans based mainly on the PAYG. The idea comes from Bismarck’s Germany of 19th century when the average life expectancy did not substantially exceed the retirement age. As a result the state PAYG schemes generated surplus used among others to fight the old-age poverty. This kind of pension system has soon spread across the world and remains crucial almost everywhere. The PAYG varies from “flat-rate” systems¹ (e.g. United Kingdom, Switzerland, Netherlands, Ireland, Denmark) providing a basic income irrespective of wages earned or contributions made, to an “earnings-related” systems² (e.g. Germany, Italy, France, Austria, Sweden) where pensions are related to past earnings, while at the same time a minimum pension is preserved (Economic Policy Committee, 2002).

Nevertheless, some of the countries, where capital markets played traditionally important role in the economy, have at least partially relied on accumulation of savings and investing them. This happened usually in cooperation with employers who for this purpose created a variety of pension funds. Such countries, including USA, Great Britain and Netherlands, have developed a combination of usually “flat-rate” PAYG and (either mandatory or voluntary) funded plans.

In 1981 South-American Chile allowed for diverting all contributions from the PAYG to the mandatory and private FF scheme. Thus it began to accumulate individual savings on personal accounts and investing them in the capital market securities. This was the first country in the world that implemented such a reform. Since then, Chile has more than twenty-year record that shows remarkable success in terms of returns and amount of pensions (Acuna, Iglesias, 2001). This has made a strong impression on many other countries. Beginning with its South-American neighbors (e.g. Peru – 1993, Argentina, Colombia – 1994, Uruguay – 1996, Bolivia, Mexico – 1997), many of them have decided to undergo such a reform and to close or at least diminish their PAYG. Facing the ageing population problem and high unemployment that both impose financial burden on the PAYG this solution has become attractive and has been at least partially implemented also in many post-communist countries (e.g. Kazakhstan, Hungary – 1998, Poland – 1999, Latvia – 2001, Croatia, Estonia, Russia – 2002) and in some western democracies (Denmark – 1983, Switzerland, Netherlands – 1985, Great Britain – 1988, Australia – 1991, Sweden – 1996). Most of them have created a combined system based on both the PAYG and the FF pillars.

However, not all countries are delighted with the idea of substituting their PAYG with the mandatory funding. Without any doubt, efficient PAYG has strong advantages (Chapter 2) that might explain its solid position in the continental Europe and

¹ A “flat-rate” system is based on a social security model developed in 1941 by a British economist William Henry Beveridge. The principle was to cover all citizens automatically, without previous compulsory contributions and without a link to employment, being mainly financed by taxes.

² An “earnings-related” system is based on a social insurance model applied in 1883 by a German Chancellor Otto von Bismarck. The principle was that of compulsory old-age insurance for low-income workers, mainly financed by social security contributions (half from employers, half from employees).

countries with a mixed system. **Even the ageing population is not a “killer” for the PAYG - the efficient although not popular answer may be prolonging of the retirement age.** Furthermore, a switch from the PAYG to the FF system requires huge transition costs (Chapter 3) that impose financial burden on the state budget. For these reasons, many countries (e.g. Germany, Italy, France, Austria, Spain, the Czech Republic, and Slovenia) concentrate on improving their PAYG and supporting voluntary funded schemes rather than on designing the mandatory funding. Moreover, debate about the rates of returns of both systems (Chapters 3, 4) suggests that each one might offer higher pensions under different conditions. **While labor market determines pensions in the PAYG, capital market development is crucial for the FF system.** A combination of both enables to diversify financial sources of future pensions between these two more or less independent factors and thus to increase the system’s overall stability.

Slovakia has chosen to build a combined system. Compared to some other post-communist countries it shifts more progressively towards the mandatory funding (Table 1). Is this a good decision? What are the main risks and opportunities it generates? And what happens with the Slovak PAYG? Is it becoming more efficient? Could it be done in a better way? And what tasks and reform options do there remain for future governments? These are the main questions analyzed in this paper.

Table 1: Mandatory pension schemes across some post-communist countries

Country	PAYG	FF	FF introduction	Source
	(% of gross earnings)			
Kazakhstan	0	10	1998	Andrews (1999)
Hungary	22	6	1998	ILO (2002)
Poland	12.22+13	7.3	1999	ILO (2002)
Latvia*	18	2	2001	OECD (2002, Latvia)
Croatia	14.5	5	2002	Anusic (2003)
Estonia	16	6	2002	OECD (2002, Estonia)
Russia**	24	4	2002	Afanasiev (2003)
Slovakia	9+6+4.75	9	2005	INEKO
Czech Republic	26	0	-	ILO (2002)
Slovenia	24.35	0	-	ILO (2002)

* – contribution rate for the FF pillar should gradually increase since 2007 up to 10% in 2010 reaching the same proportion for both pillars (10%+10%=20%)

** – contribution rate for the FF pillar should gradually increase up to 6% resulting in 22%+6%=28% in 2006

CHAPTER 1: Reform Proposal in Slovakia

Contemporary social security system in Slovakia is the un-funded PAYG where current workers pay out current pensioners. Since 1997 this system has been complemented by a smaller voluntary and private funding. The PAYG covers the old age, disability and survival pensions. It is administrated by the Social Insurance Agency (SIA), which is a state-owned institution, separated from the state budget. Since 1997 the PAYG has generated deficit mainly due to high unemployment (state

was paying low contributions for the unemployed people) and high evasions (people avoided to pay contributions) – see Figure 1. The evasion may be explained as a result of low motivation of people to pay into the system because the old-age pension did not sufficiently reflect the amount of contributions paid during their working life (Chapter 2). Therefore, people perceived the contributions rather as taxes and avoided to pay them.

Financial imbalance was the main reason of gradually decreasing portion of the average pension on the average wage (Figure 2). There emerged an increasingly widespread belief among new entrants into the labor force and the general public that the system could not meet its “promises” in the future. Younger workers were becoming skeptical about their prospects as pensioners - trust in the system was eroding. Together with hampered motivation, these were the main factors inducing willingness of public to reform the old PAYG. Moreover, policy makers and experts (Thomay, 2002) anticipated that the expected demography crisis would reveal the implicit deficit³ and create further pressure on the PAYG balance. In order to stop the growth of the pension system’s deficit and to mobilize individual effort to secure suitable living standard in retirement age, the new government decided after the parliamentary elections in autumn 2002 to reform the pension system. The legislation framework was prepared and adopted in 2003 and the new system should completely start to operate in January 2005. In its Program Statement, the government laid down the basic feature of new pension system - the introduction of mandatory FF pillar:

“...Important reformatory principle is strict separation of solidarity within the society by individual mandatory savings or insurance. Costs of the social solidarity have to be covered from clearly named sources. On the other hand, the contribution burden should be a tool of personal savings or insurance and should be based on strict meritoriousness.

The government will set up framework for gradual creation of safe and fair pension system, based on three main pillars that will be universal for all productive citizens. To stop the demography-contingent growth of the un-funded pension system’s internal debt and to mobilize individual effort on everyone’s living standard in retirement age are goals of the reform. Contributions to the un-funded pay-as-you-go system should be lowered as much as possible, however considering the government’s capacity to assure sources for the Social Insurance Agency.”

In April 2003 the Slovak government approved the Conception of the Pension Reform in the Slovak Republic. According to this document, better recognition of property rights and personal freedom and responsibilities should be assured by shifting as much responsibilities as possible to the private sector and individuals. The new system should be based on three pillars that will be universal for all productive citizens with the temporary exception of armed forces (e.g. soldiers and policemen)⁴:

- Mandatory, state, un-funded, pay-as-you-go pillar;

³ Here, the implicit pension debt is understood as a negative difference between the present value of all future contributions and all future pension payments.

⁴ However, there is a political agreement about cancellation of these exceptions in the following years.

- Mandatory, private, funded pillar;
- Voluntary, private, funded pillar⁵.

Table 2: The rate of mandatory contributions (% of gross wage, paid by employee and employer)

	Before reform	After reform		
	Together	Old age	Disability	Reserve
PAYG	28%	9%	6%	4.75%
Funded	-	9%	-	-
Together	28%	28,75%		

Source: Ministry of Labor, Social affairs and Family in the SR

The rate of the old-age pension contributions will be 9% of the monthly gross wage to the (first) PAYG pillar and 9% to the new, mandatory (second) FF pillar. The maximum gross wage for paying contributions will go up from SKK 32,000 to triple the average gross wage in the economy (roughly SKK 45,000 in 2005). Together with higher percentage of contributions this will increase the overall pension contribution burden.

CHAPTER 2: Reform of the PAYG

2.1 Before the reform

Until the end of 2003, each person was entitled to an old age pension after a minimum of 25 years of work and attaining a minimum age (men 60 years, women 53-57 years of age depending on the number of raised children). For the purpose of computing the pension amount, complicated formulas were being used, which basically took into account (1) the duration of employment and (2) the average income calculated as an average monthly income earned in the “best” five years during the last ten years prior to claiming an old age pension. The average monthly income was adjusted in the following way: SKK 2,500 was accounted completely; amount between SKK 2,501 and SKK 6,000 was accounted as one third; amount between SKK 6,001 and SKK 10,000 as one tenth. The amount above SKK 10,000 was not taken into calculation. For instance, adjusted average monthly income of a person earning during five “best” years SKK 10,000 monthly on average would be $2,500 + 1,167 + 400 = \text{SKK } 4,067$, which was also the maximum sum. For purpose of the old age pension calculation only 50% - 67% share of adjusted monthly average income (depending on the duration of employment) was considered. In order to balance newly awarded pensions and several-times indexed pensions, the newly awarded pensions were multiplied by a given percentage and added a given fixed amount. The final amount of an old age pension would be the sum of (1) the share of the adjusted monthly average income, (2) the indexed share of the adjusted monthly average income and (3) the fixed amount. As shown in Table 3, **these calculations were highly re-distributive and almost deterred the link between monthly average income and the amount of pension. For example monthly income above SKK 10,000 was not considered in**

⁵ The reform of the third pillar is introduced by a proposal of new Law on Supplementary Pension Savings. The government has not approved it yet but it should come into force since January 1, 2005. The reform should strengthen regulation and supervisory by applying the standards valid for asset management companies (independent supervisory authority, strict separation of pension funds from pension companies' assets). The tax exemptions should be substituted by the direct state payments.

these calculations although the average monthly gross wage in Slovakia was SKK 13,511 in 2002. This had negative impact on motivation to pay social security contributions.

Table 3: Pensions before the reform of PAYG (before 1.1.2004, in SKK)

	Duration of employment**							
AMI*	35	36	37	38	39	40	41	42
7245	6462	6547	6633	6719	6805	6891	6976	7062
8280	6602	6690	6778	6867	6955	7043	7131	7219
9315	6743	6833	6924	7014	7105	7195	7286	7376
10350	6836	6928	7020	7112	7204	7296	7388	7480
11385	6836	6928	7020	7112	7204	7296	7388	7480

* Average monthly income earned in the “best” five years of the last ten years of employment.

** Including school years, compulsory military service and maternity leave.

Source: INEKO

Indexation of formerly awarded pensions: These were indexed if the cost-of-living index, measured by the Statistical Office from monthly household budget surveys increased by more than 10%, or the average wage in the economy grew by more than 5%. Legislation did not specify a fixed percentage of increase and no deadlines for valorization. These decisions had to be approved by the government and the parliament and were often used as tools for political agenda.

2.2 Reform options

The main problem of almost all PAYG schemes in the world has been identified as the inability to finance promises it gave to former contributors. This means an increasing financial deficit resulting from the inability to cope with the employment (i.e. also demography) crises. This problem is common in all countries with strong so-called “**Defined Benefit**” (DB) PAYG plans, where the amount of pension depends mainly on variables other than contributions. Regardless what happens with the demography or in broader sense with the employment, this system promises a fixed replacement rate⁶ (defined benefit). Therefore, the risk that there will be lack of money to finance given promises, remains to the future. The financial deficit is usually direct consequence of worsen demography (ageing population). In Slovakia, population is relatively young and will remain so for the following decade (Figure 3). As mentioned earlier, the financial deficit is rather a consequence of high unemployment and low motivation to pay contributions. Because the unemployment is a structural problem resulting from the transition process, it can be solved only in a longer time period. To solve deficit immediately, the Slovak government had to implement so called **parametric reform** of the PAYG aimed basically at increase of the money inflows and decrease of the money outflows in the Social Insurance Agency. As the inflows are mainly function of contributions and the outflows are mainly function of pensions, there appeared to be following options for the parametric reform:

1. Raising the contribution rate;
2. Prolonging the retirement age;

⁶ The replacement rate means the ratio of the worker’s first benefits received upon retirement and the last pre-retirement gross wage.

3. Pensions' reduction or change in their indexation.

Because the contribution rate (28% of the gross wage) was perceived as already too high and pensions too low, the reform relied mainly on a second option. However, parametric reform does not solve the motivation problem. Therefore, so-called **systemic reform** of the PAYG was necessary. This required a change of pension formula in order to enforce the link between contributions and amount of pension. Such a change would represent a shift towards the **“Defined Contribution”** PAYG, an alternative to the “Defined Benefit” system. A good example of such reform is Sweden (Palmer, 2000), which replaced its “Defined Benefit” PAYG with so-called **“Notional Defined Contribution”** (NDC) PAYG. In this case, the principle of PAYG, when current workers pay out current pensioners, remains the same. However, it brings two major innovations: (1) each individual has his/her own notional account in the central system, where life-long money inflows and outflows are recorded, and (2) the pension is calculated as an account remainder at the chosen time of retirement divided by an estimate of life expectancy for an individual of that specific age, i.e. it depends heavily on contributions paid during the working life. After retirement, all people should receive back money paid in their productive age. Ideally, this money should be a personnel property of an individual and should become a part of his/her heritage. This should eliminate evasion and maximize the incentive of people to pay contributions to the central insurance agency. Of course, NDC remains sensitive to employment changes that might be caused by demography crisis. Therefore, to secure its long-term financial stability, the system should guarantee flexible reaction on such changes. This could be solved by the introduction of so-called automatic stabilizers, i.e. **automatic parametric reforms** of the PAYG explained later in this chapter.

Generally, the Slovak government had several reform options regarding the PAYG:

1. Parametric reform;
2. Change of the pension formula (link between wages and pensions);
3. Introduction of DC/NDC instead of DB system;
4. Introduction of automatic stabilizers.

2.3 After the reform

The reform of the PAYG “first” pillar introduced by a new Law on Social Insurance has been approved by the Parliament on September 24, 2003. This Law came into force on January 1, 2004. Generally, it brings two major innovations:

1. Parametric reform: Gradual prolonging of statutory retirement age from the average 55 years for women and 60 years for men to the final 62 years for both genders. All men will retire at the age of 62 since 2006 and all women since 2015.
2. Change of the pension formula:

Equation 1: Pension in reformed PAYG

$$R = POMB * St * ADH$$

“S_t” stands for a number of years of paying contributions to the Social Insurance Agency (working period).

“ADH” (Actual Pension Value) is a number given directly by law on basis of special calculations aimed at providing the 50% replacement rate in the first year after the reform. For 2004 the “ADH” has been set at 183.58.

“POMB” (Average Personal Wage Point) represents the ratio of the individual gross wage to the average gross wage in the economy. It is computed as an average of ratios respective to each year since 1994 till the last year of employment. For example “POMB” 1.00 would mean that the worker has earned the average wage in the economy; with 0.50 he has earned half the average wage; with 2.00 twice the average wage. Full values of “POMB” below 1.00 and above 1.25 will be employed gradually in a **three-year transition period**. Afterwards, system should offer no re-distribution between rich and poor.⁷ Maximum “POMB” is 3.00 corresponding to the maximum base for contributions that is 3-times the average monthly gross wage in the economy.

Compared to the former formula, this one gives higher pension to those who earned more and paid higher contributions during their working life and vice versa (Table 4). This should increase motivation to pay contributions and eliminate evasion. The reduced re-distribution could be dangerous for people with lower income. To avoid old-age poverty the new law guarantees minimum pension of 120% of the living wages, i.e. SKK 5052 in 2004. People with lower pensions will be supported directly from the state budget.

Table 4: Pensions after the reform of PAYG (after 1.1.2004, in SKK)

	Duration of employment**							
AMI* (POMB)	35	36	37	38	39	40	41	42
7245 (0,7)	4498/5052	4626/5052	4755/5052	4883/5052	5012/5052	5140	5269	5397
8280 (0,8)	5140	5287	5434	5581	5728	5875	6021	6168
9315 (0,9)	5783	5948	6113	6278	6444	6609	6774	6939
10350 (1,0)	6425	6609	6792	6976	7160	7343	7527	7710
11385 (1,1)	7068	7270	7472	7674	7876	8078	8279	8481
12420 (1,2)	7710	7931	8151	8371	8592	8812	9032	9252
13455 (1,3)	8128	8360	8592	8825	9057	9289	9521	9754
14490 (1,4)	8321	8558	8796	9034	9272	9509	9747	9985

* Average monthly income earned since 1994 till 2003.

** Including compulsory military service and maternity leave (in a new system, state refrains from paying contributions for students and unemployed).

*** Blue numbers show the minimum pension guaranteed to be paid out from the state budget.

**** The gap between the lowest and the highest pension will increase further until 2007 when there will be zero redistribution.

Source: INEKO

⁷ The OECD (2004) expects that “the replacement rates will decrease sharply for low wage earners at the end of a three-year transition period, and authorities should check if trend wage growth will be sufficient to provide a minimum retirement income for all.”

Indexation of newly awarded pensions: The Law assumes automatic yearly valorization of “ADH” by the average nominal wage growth in the economy.⁸

Indexation of formerly awarded pensions: The Law assumes so-called “Swiss method”, i.e. automatic yearly valorization of awarded pensions by the weighted average of the consumer price index (inflation) and the average nominal wage growth in the economy. The weights will be 0.5 for both parameters.

Generally, changes in the indexation weaken political influence on pensions’ calculation and bind them to the development of economic indicators. This is a good message, as the indexation often used to be a subject for political fight. On the other hand, **the indexation does not fully reflect the change in the sum of money collected by the Social Insurance Agency (i.e. changes in the employment, caused by demography, migration or unemployment changes) what harms system’s sustainability.**

Early and late retirement: Unlike in former system, the reformed PAYG allows for early and late retirement. Each month of earlier retirement reduces a pension by 0.5% and each month of later retirement raises it by 0.5%.

2.4 Recommendations

Although the designed PAYG strengthens the meritoriousness, it is still unable to react on employment changes. As these changes have crucial impact on the money inflow to the Social Insurance Agency (collected contributions) they represent key limiting factors for the amount of pensions. However, neither the pension calculation formula nor the indexation rules reflect these changes. The amount of pension in the designed PAYG depends basically on four factors: (1) fixed replacement rate represented by the variable “ADH” in the formula, (2) nominal wage growth in the economy used for the indexation of newly awarded pensions (valorization of “ADH”) and formerly awarded pensions, (3) inflation used for the indexation of formerly awarded pensions and (4) contributions (indirectly through individual wage and working period). Because none of these factors reflects changes in employment, the system continues to give non-guaranteed promises. Based on demography expectations (Figure 3), this problem might be relevant as soon as in 2015 due to the system’s generosity under the expected demography crisis. **Partial solution could be the indexation of both formerly and newly awarded pensions by the rate of change of real money available at the Social Insurance Agency (collected contributions).**⁹ In real life this would allow for pension’s reduction in case of poor collection and on opposite pension’s increase in fruitful years. However, it would be dangerous to apply this indexation simultaneously with prolonging the retirement age as the latter causes a steep rise in the money collected.

⁸ For simplification the calculation presented in Chapter 4 of this paper assumes that the “ADH” will be valorized each year by the average real wage growth in the economy, which is equivalent of the nominal wage growth adjusted for the inflation.

⁹ The other option would be to index just by inflation that is expected to be lower than the wage growth in the following years. However, this is not a systemic solution as it does not guarantee the system’s stability in the long-term when the inflation could be higher than the wage growth.

The proposed prolonging of retirement age will finish in 2015. At the same time negative consequences of demography development could affect the economy. In the designed PAYG, if the dependency ratio¹⁰ hiked rapidly (see also Chapter 4), the SIA would collect noticeably less money but it would have to pay out the same or even more money on pensions. Thus it would soon go to deficit requiring other reform of the PAYG including all the options mentioned earlier.¹¹ Another parametric reform would mean further prolonging of retirement age, raising the contributions, change in the pension formula and/or change in the pensions' indexation. Most of these decisions are not popular and meet strong resistance from the public and politicians. Moreover, **perceived inability to fulfill its promises (i.e. to pay out its implicit debt) is the main reason why many people and even policy makers believe that the PAYG system is not sustainable. Therefore, the goal of a reform should be to create a system that would guarantee the ability to meet its promises and become sustainable. Technically, such system should respect this basic rule: at given time it should distribute among pensioners no more and no less but the money collected from the productive work force (after subtracting the administrative costs). Hence, it should not be allowed to end up in surplus or deficit. Such a rule is rather easy to apply under the minimum "flat-rate" DB PAYG where everybody receives the same basic pension serving as a poverty barrier.¹² The problems arise under the DB PAYG that differentiates pensions and aims at keeping a given replacement rate through political decisions. If the replacement rate is too high the system runs into deficit that could be covered either by raising the contribution rate or by prolonging the retirement age. These measures are unpopular but are likely to be accepted if there is a perfect differentiation (i.e. no redistribution between rich and poor). However, with too high contributions (and/or too long working life) and too high redistribution people seek to avoid paying contributions and system runs again into deficit. Thus, the systems' stability depends on the degree of redistribution or in other words on the degree of reflecting the contributions either directly or indirectly through reflecting the length of working period and/or the amount of wage. Therefore, a shift toward the DC PAYG, where the redistribution is close to zero, increases motivation to pay contributions and decreases the risk of deficit.** The PAYG scheme designed in Slovakia meets these requirements but there are several other options. One of them represents the NDC PAYG mentioned earlier, another one could be the introduction of a perfect "earnings-oriented" DC PAYG (i.e. with zero redistribution) based on a "flat rate" calculation adjusted for relative wage and working period of an individual (Equation 2). However, only the last alternative fulfils

¹⁰ The dependency ratio is defined as a measure of the portion of a population which is composed of dependents (people who are too old to work). It is equal to the number of individuals in post-productive age (for example above 65) divided by the number of individuals in productive age (for example between 18 and 64, expressed as a percentage. Thus, a rising dependency ratio is a concern in many countries that are facing an aging population, since it becomes difficult for pension and social security systems to provide for a significantly older, non-working population.

¹¹ This view supports also the OECD (2004) report: „The (PAYG) system remains nevertheless financially unsustainable in the long term. The planned defined benefit scheme with its strict link between contributions and benefits should, upon completion, transform workers' perception of pension contributions from quasi-taxes to quasi-savings. Further changes in the PAYG system are desirable, notably the standard retirement age should be raised progressively to 65 for both genders.“

¹² The collected sum of money after subtracting the administrative costs is simply divided by the number of pensioners qualified for the minimum "flat-rate".

the “basic rule” mentioned above (even though indirectly) and directly reflects changes in dependency ratio, i.e. employment, and demography changes (Table 6).

For other two alternatives only the introduction of **automatic stabilizers** would guarantee system’s ability to pay out its promises and to secure its long-term financial stability. Such stabilizers could include the automatic change in the contribution rate and/or in the retirement age as a reaction on changes in the replacement rate and consequently in the financial balance of the pension system. To avoid pensioners’ poverty and/or too high generosity all three systems could guarantee certain range for the replacement rate: for instance 40-50%. If the calculated pension would exceed the upper limit the state would pay just this upper limit and save generated surplus for worse times and/or lower the contribution rate and/or shorten the retirement age. The opposite would apply in other case – falling bellow the lower limit.

Table 5: Characteristics of different types of PAYG

Type of PAYG	Redistribution	Reflects contributions	Meets “Basic rule”
Before reform	high	no	no
After reform	zero	yes, indirectly	no
NDC	zero	yes	no
Adjusted “Flat-rate”	zero	yes, indirectly	yes, indirectly

Source: INEKO

Equation 2: Pension in the DC PAYG calculated from the “flat-rate”

$$R = (M / N) * (W / Wa) * (S / Sa)$$

Table 6: Variables used for computing the pension in the DC PAYG base on the “flat-rate”

R	Pension (at given time “t”)
M	Money collected (at given time “t”) in the central insurance agency
N	Number of pensioners (at given time “t”) in the economy
M/N	“Flat-rate” (at given time “t”)
W	Individual wage (average in working period “S”)
W _a	Average wage in the economy (in working period “S”)
W/W _a	Wage ratio (similar to “Average personal wage point” in 2.3)
S	Working period (number of years of paying contributions)
S _a	Average working period in the economy

CHAPTER 3: Introduction of the Mandatory Funded System

The Slovak government officials cited three main arguments in favor of diminishing the PAYG and introduction of the second private FF pillar of personal accounts:

1. Inability of PAYG to mobilize individual effort to secure the retirement
2. Inability of PAYG to solve the threatening demography crises
3. Higher expected replacement rates

The second chapter showed that the DC/NDC PAYG could eliminate evasion and motivate people to pay contributions in order to secure suitable living standard in the retirement age. It also showed that any kind of the PAYG remains sensitive to the demography crises and is unstable without automatic stabilizers. But are the FF

schemes able to cope with demographic crisis? And which system offers higher replacement rates, i.e. higher pensions? What are the determining factors? To answer these questions, it is necessary to identify the variables conditioning the real rates of return of the both funded and unfunded schemes. Before that, a brief description will present the main features of the introduced funded pillar.

3.1 Description

The new mandatory FF “second” pillar was introduced by a new Law on Old-Age Pension Savings. The Parliament approved it definitely on January 20, 2004, and it will come into force starting from January 1, 2005. The infrastructure - mainly creation and licensing of new pension companies - should be functioning until the end of 2004. All citizens up to a defined age (approximately 52 years) will be allowed to choose to enter for the FF pillar since January 2005 till June 2006. Once entering, there will be no way back. Young people first entering the labor market and emerging self-employees will be obliged to switch. The assets will be managed by private pension companies competing on the market. They will be supervised by an independent Financial Supervision Authority that should later become a part of the Slovak Central Bank. The founders of pension companies will have to be credible financial institutions with at least 3-year experience. Minimum basic capital is set to SKK 300 million (EUR 7.1 million). Each one will manage three funds with different investment limits and different risk & return relationships (see Table 7). Money paid to the second pillar will be a private hereditary ownership of savers. It will be excluded from the public finances. The interest earned on funds will not be taxed.

Table 7: Pension funds managed by pension companies

	Equities	Bonds & Money Market Instruments	Risk & Return
Growth fund	up to 80%	no limit	high
Balanced fund	up to 50%	at least 50%	middle
Conservative fund	no stocks	100%	low

Source: Law on Old-Age Pension Savings

Investment portfolio: Equity is too volatile to provide stable income in retirement years, although it can be a valuable component of an investment portfolio during the accumulation phase. Bonds provide savers with a more stable income, at the cost of lower rate of return. For this reason, clients of pension funds invest primarily in equity, to gain the advantage of a large, though volatile, return, and then shift gradually to bonds as the date of retirement approaches. Allowing for such investment strategy was the main reason for creating three different funds in the Slovak system. Each saver may hold the assets only in one fund at the same time. Up to 15 years before retirement saver may not hold assets in the growth fund and up to 7 years assets in the balanced fund. The securities must be traded on a public stock exchange.

Guarantees: The state will guarantee neither a specific performance of pension funds, nor the principal value of paid contributions. The life-insurance companies will pay out the pensions. In case of fraud or malefaction the state will guarantee 100% of granted pension.

Investment restriction: The law states, that the investment into the securities issued by Slovak emitters shall be at least 50% of the funds’ portfolio. The advocates of this

limitation argued that it should “disable the outflow of domestic capital..., accumulate sources for investment into the Slovak economy..., and help to develop the Slovak capital market”. However, most economists warn of the restriction’s negative effects. Generally, it constrains choosing the best investment opportunities what, if not changed, **will have negative impact on the rate of return of the funded pillar and the amount of pensions.** Moreover, the restriction almost deters the sense of the growth fund. This is due to the fact, that the Slovak stock market is limited in its size and attractiveness and at least half of the assets will have to be invested mainly into the fixed-income securities, among them government bonds and state deposits. Thus, the upper 80 % limit for equity investment will be hardly achievable. Furthermore, the liquidity excess on domestic market might cause a fall in interest rates, i.e. in the rate of return of the FF pillar. It also might cause an artificial rise in the price of domestic securities and generate a “bubble” that could endanger future pensioners. Moreover, through cheaper deficit financing the fall in interest rates would tempt the state to higher (and not always effective) expenses. Last but not least, the restriction does not comply with the EU rules for free flow of capital and – as shown in the end of this chapter – **it limits one of key advantages of the FF pillar, namely its ability to face the demography crisis.**

Transition costs: Creation of the second pillar causes high transition costs appearing in several on-coming decades (Tables 8-10). As mentioned in the first chapter these costs are a big obstacle for many countries with strong PAYG pillars considering switching from the PAYG to the mandatory funded schemes. Transition costs are namely a consequence of diverting contributions from the PAYG to the second pillar – as a result the center social insurance agency receives less money but it still has to pay out the same or similar number of current pensioners. Hence, transition costs depend positively on the contribution rate for the funded pillar and on the number of people switching. In Slovakia, these costs should not exceed 1% of Slovak GDP yearly (in 2005 circa SK 15 billion or EUR 0.36 billion). This is a political commitment taken with respect to the Maastricht criteria for the adoption of common European currency that require the accession country to keep its fiscal deficit below 3% of GDP at least two years before the Euro adoption.¹³ There are several options how to finance transition costs: Large part will be covered from (1) the reformed PAYG that will generate higher revenues after prolonging the retirement age - **the link between the introduction of the funded pillar and the need to prolong the retirement age is evident** (Tables 8-9) – and that will generate sources in the SIA reserve fund (4.75% of monthly gross wage, preferably for covering the PAYG deficits). Other sources are (2) privatization revenues (government has saved SKK 65 billion, or EUR 1.55 billion especially for this purpose), (3) state budget and (4) loans. To keep transition costs below 1% of GDP, substantial changes effected the original reform proposal: the disability insurance (6% of monthly gross wage) went back to the PAYG and proposed 10% contribution rate for the FF was decreased to 9%.

¹³ OECD (2004) warns: “A special issue related to the phasing-in of the second pillar concerns the fiscal compensation of the main pillar from the state budget, for the diversion of PAYG contributions. These may amount to about one per cent of GDP per year in the short-term and will likely increase in the following decades. As long as no agreement is reached with the European institutions for the exclusion of such compensation from current expenditures, Slovak authorities will be faced with a difficult choice between postponing or down-scaling the second pillar reform, delaying convergence with Maastricht rules, or seeking yet further spending cuts.”

Note: Expectations presented in Tables 8-10 are calculated under the assumption that more than a half of people under 40 years will choose to change for the second FF pillar and more than a half above 40 years will stay in the PAYG. Transition costs would rise substantially in case of massive switching, and would be much lower in case of moderate transfer. For research on willingness to switch see Figure 4.

Table 8: Transition costs (money flowing to the second pillar, in % of GDP)

2005	2006	2007	2008	2009	2010	2011	2012	2013
0.28	0.97	1.03	1.07	1.13	1.18	1.22	1.28	1.33

Source: Law on the old age pension saving (Clause on economic and financial impacts)

Table 9: Transition costs after subtracting the PAYG savings (in % GDP)

2005	2006	2008	2010	2012	2015	2018
0.08	0.26	0.25	-0.08	-0.13	0.04	0.60

Source: Law on the old age pension saving (Clause on economic and financial impacts)

Note: The sign “-“ indicates that the PAYG savings will be higher than the transition costs.

Table 10: Transition costs after subtracting the PAYG savings in the long term (in % GDP)

Scenario	2005	2010	2015	2020	2030	2040	2050	2070
A	0.08	-0.08	0.04	0.94	1.82	2.02	1.90	0.64
B	0.08	-0.63	-1.10	-0.23	0.76	0.94	0.91	0.14

Source: Law on the old age pension saving (Clause on economic and financial impacts)

Notes:

Scenario A – prolonging the retirement age according to the law (up to 62 for both genders)

Scenario B – prolonging the retirement age up to 65 for both genders (9 months each year)

The sign “-“ indicates that savings in the PAYG will be higher than the transition costs.

The PAYG savings generated after prolonging the statutory retirement age up to 62 years for both genders should cover almost all transition costs until 2015 (Table 9). The remainder will have to be covered from other sources, e.g. privatization revenues. However, the PAYG savings would not be sufficient in case of massive switching for the FF pillar. In the long run, even after prolonging the retirement age up to 65 years for both genders (Scenario B), there will be a gap in the financial balance of the PAYG after 2030 (Table 10). This will be due to the combined effect of demography crises and high transition costs.

3.2 “Aaron-Samuelson condition”

As mentioned before, to compare performance of the PAYG and the FF pillars as well as their ability to avoid demography crisis, it is necessary to identify factors determining the real rates of return. A good deal of analysis of the un-funded social security offers so called “Aaron-Samuelson condition” named after seminal articles by Aaron (1966) and Samuelson (1958). Following this condition, the real rate of return in a mature PAYG system is equal to the sum of the growth rate of the labor force and the growth rate in productivity (Equation 3), the latter of which can also be expressed alternatively as the real wage growth (Orszag 1999, p.17). Since the labor force changes only slowly, and wages tend to be a constant fraction of national income, the condition implies that in a short run the real return on contributions in a mature PAYG scheme will be approximately equal to the growth rate of gross domestic product.

Equation 3: Aaron-Samuelson condition

$$r = (n + g)$$

Table 11: Variables used in Aaron-Samuelson condition

r	Real rate of return in PAYG
n	Rate of growth of the labor force
g	Rate of growth in productivity (real wage growth, sometimes referred to as a speed of technological advance)

Participants in the FF scheme are accumulating capital that is invested in the capital markets. Thus they earn a return on their investment portfolio that may consist of stocks, bonds and other assets. The mechanical application of the “Aaron-Samuelson condition” would compare the real rate of return on capital (the return on a funded scheme) with the real return on an un-funded scheme, as derived above. However, it is necessary to subtract from the gross returns on capital the costs of administration¹⁴ (Equation 4), which are everywhere higher for private than for public pension plans, and are particularly high in case of private individual accounts (Willmore 1998).¹⁵

Equation 4: Application of the “Aaron-Samuelson condition”

$$(n + g - c_1) \leq ? \geq (a - c_2)$$

Table 12: Variables used in Application of the Aaron-Samuelson Condition

c1	Costs of administration for private pension plans
c2	Costs of administration for public pension plans
a	Real rate of return on capital (the return on a funded scheme)

The preceding analysis shows that while the performance of the PAYG depends on the labor market (real wage growth, population change), the FF depends on the capital market. Therefore, the two-pillar pension system diversifies financial sources of future pensions. Furthermore, the PAYG is bound to a particular geographical area and the FF is thanks to the free flow of capital geographically unlimited. Hence, the correlation between rates of return of both pillars is rather low and the diversification increases the system’s stability. This argument is perhaps the strongest one that supports the idea of a combined pension system.

3.3 Demography crises and the Stock Market

This section analyzes the effect of change in demography on the real rate of return on capital. It is obvious that fewer people at work, they need to be more productive in order to produce the same output. Thus, the performance of company producing this output and the price of its shares depend not only on technology but also on the number of workers employed. Fewer the workers lower the price of shares (rate of return on capital) holding other things such as labor productivity constant. The idea that demographic forces have a powerful impact on economic activity more generally – on capital accumulation and output – and hence on the stock market, is far from

¹⁴ This paper does not include administrative cost analysis. Therefore, in the following discussion, the net terms of the real rate of return in the PAYG as well as in the FF system is considered. The “net return” means the return adjusted for the costs of administration and possible taxes.

¹⁵ Thomay (2003, p. 8) writes: “...in the proposed (FF) model, we can expect high administrative costs reaching in the beginning 5-10% of the assets accumulated on individual accounts and in the long term 1-2%, what is still 5-10 times more than administrative costs in the pay-as-you-go system. In a 40-year saving period the administrative costs of 1% cut down the pension about 20% and of 2% about 35%.” For further analysis on administrative costs see also Horváth, Lendacký (2003).

new. It formed the basis for the classic studies of Kuznets (1958, 1961) on the influence of long swings in the growth of population on capital accumulation and the stock market in the late 19th and early 20th centuries. More recently the controversial paper of Mankiw and Weil (1989) studied the impact of predictable demographic change on the housing market and Geanakoplos and Magill (2002) developed predictability model of the stock market based on demography expectations. Their model supports the view that a substantial fall in the price-earnings ratio is likely in the next 20 years in the US economy as a consequence of negative demographic development. Similar results can be observed using the stock market supply-demand analysis. The assumption is that all workers are willing to buy shares in order to accumulate capital for later retirement and all pensioners are willing to sell shares in order to get money for consumption. With the demography crisis the number of workers falls while the number of pensioners rises, holding the retirement age constant. More pensioners are willing to sell their shares - higher is the supply on the stock market. On the other hand, fewer workers are willing to buy shares - lower is the demand for these shares on the stock market. As shown in the Figure 5, demography crisis causes a rightward shift of the supply curve, and a leftward shift of the demand curve resulting in the fall of stock prices and the rate of return on capital.

In summary, if capital is accumulated in an economy with changing labor force, the rate of return on capital is changing as well and its expectations need to be adjusted for “n” or the rate of change in labor force. Therefore, holding other things equal, the country with negative demography expectations can avoid possible downturn in the rate of return of its FF pension system only if it exports capital to the economy with stable or positive demography changes.

This is quite a strong conclusion, because it shows that there is a possibility how to avoid the employment or demography crises in the funded scheme. While the PAYG is bound to the particular geographical area and can solve these problems only through prolonging the retirement age or increasing the contribution rate, the funded scheme may take the advantage of free movement of capital and export the pension savings into the country with higher technological advance and/or with better demographic development. However, Table 13 shows that the expected demography crisis is a world - wide phenomena and that also profiting from free flow of capital has its limitations. Moreover, as explained earlier, the restriction that binds at least 50% of investment portfolio to Slovak securities presents another administrative barrier.

Table 13: World demography changes

Portion of population above 65 years (v %)				Support ratio: (20-59 years)/(above 60 years)			
	2000	2015	Difference	2000	2040	Difference	
Argentina	9.7	10.7	1.0	2.4	1.4	1.0	Sweden
Russia	12.5	13.8	1.3	2.9	1.8	1.1	Russia
India	5.0	6.4	1.4	2.6	1.5	1.1	Great Britain
Turkey	5.8	7.2	1.4	2.7	1.5	1.2	France
Indonesia	4.8	6.4	1.6	3.8	2.4	1.3	Argentina
USA	12.3	14.4	2.1	2.9	1.6	1.3	Hungary
Mexico	4.7	6.8	2.1	2.4	1.1	1.3	Italy
Brazil	5.1	7.3	2.2	2.5	1.1	1.3	Germany
Slovakia	11.4	13.7	2.3	2.4	1.1	1.3	Japan
China	6.9	9.3	2.4	3.4	1.8	1.6	Poland

Chile	7.2	9.7	2.5	3.4	1.7	1.7	USA
France	16.0	18.6	2.6	3.3	1.3	2.0	Czech Republic
Poland	12.1	14.8	2.7	3.7	1.6	2.1	Slovakia
Hungary	14.6	17.4	2.8	6.4	3.3	3.1	India
Great Britain	15.8	18.9	3.1	5.2	2.2	3.1	Chile
Italy	18.1	22.4	4.3	7.1	3.6	3.6	Turkey
Germany	16.4	21.0	4.6	5.6	2.0	3.6	China
Sweden	17.4	22.3	4.9	7.1	2.9	4.2	Indonesia
Czech Republic	13.8	18.7	4.9	7.0	2.7	4.3	Brazil
Japan	17.2	25.8	8.6	7.6	2.8	4.8	Mexico
Source: Human Development Report 2002, UNDP				Source: The World Bank			

CHAPTER 4: Replacement rates in the PAYG and the FF

To analyze the ability of pension system to offer adequate pensions (in terms of replacement rates), INEKO developed theoretical calculations for the funded pension system, the PAYG designed in Slovakia (after the reform)¹⁶, and the DC PAYG.

4.1 Fully Funded Pension System

In the funded pillar the pension depends on the amount of money that the worker saved on his personal account during his working life and on the net rate of return on that savings that the pension company (and/or life insurance company) was earning during the saving (and/or retirement) period. The amount of money saved depends on the contribution rate, the wage and the length of saving period.

Table 14: Variables used in the calculation of pension under the FF pillar

W	Monthly gross wage of worker at the time when he starts to save
c	Contribution rate (percentage of monthly gross wage that the worker saves on his personal account)
g	Average yearly real wage growth during the working life of worker
a	Average yearly real rate of return on savings earned by pension company during the savings and the retirement period after subtracting all administration fees and taxes (net appreciation)
S	Savings at the time when worker retires
S _t	Savings period
R	Average monthly pension
R _t	Retirement period
r	Replacement rate for the funded system (ratio of average monthly pension to monthly gross wage earned at the last month of working life)

Note: The contribution rate “c” and the average real wage growth “g” are assumed to be constant during the productive life of individual. The average real rate of return on savings “a” is assumed to be constant during his/her productive life and retirement period. In real life “a” tends to be higher at the beginning of savings period and decreases as retirement approaches and investment portfolio gets less risky.

Equations:

¹⁶ The calculation for the designed PAYG is based on the formula described in the second chapter.

The amount of savings at the time when worker retires is computed using the formula for geometrical series with the combined cumulative effect of real wage growth and real rate of return on capital.

Equation 5: Savings in fully funded system

$$S = (W * c * 12) * (1 + a)^{St} * \left[\frac{\left(\frac{1+g}{1+a} \right)^{St} - 1}{\left(\frac{1+g}{1+a} \right) - 1} \right]$$

The average monthly pension is computed as an annuity resulting from the amount of savings. Simplifying assumption is made, that the remainder on personal account during retirement is appreciated at the same rate “a” as it was during savings period:

Equation 6: Pension in fully funded system

$$R = \left[S * \left(\frac{a * (1 + a)^{Rt}}{(1 + a)^{Rt} - 1} \right) \right] / 12$$

The replacement rate for funded system is computed as a ratio of average monthly pension to monthly gross wage earned at the last month of individual’s working life:

Equation 7: Replacement rate in fully funded system

$$r = \left(\frac{R}{W * (1 + g)^{St}} \right) * 100$$

4.2 PAYG based on the DC system

In the DC PAYG with zero redistribution the pension depends on the past contributions and on the money available at the central insurance agency at the time of pension payment. This money is equal to the actual sum of contributions collected from the productive part of population, so it depends on the actual employment in society and on the actual contribution rate. The employment depends on demography, retirement age, unemployment rate and immigration. The following theoretical calculation considers the system that is purely contribution-defined and offers zero redistribution between rich and poor. The central insurance agency distributes all collected money among pensioners. The pension reflects fully the relative length of working life and the relative amount of paid contributions.

Table 15: Variables used in calculation of pension under the DC PAYG

W	Monthly gross wage of worker at the time when he starts to pay contributions to PAYG
W _a	Average monthly gross wage in the economy at the time when worker starts to pay contributions to PAYG
c	Contribution rate (percentage of monthly gross wage paid by worker to PAYG)
g	Average yearly real wage growth during working life of worker

D_t	Support ratio in 2002, $D_t = 2.8346$
D	Support ratio at the time of retirement
S	Money paid to PAYG up to the time when the worker retires
S_t	Length of contribution paying (working life)
R	Average monthly pension
R_t	Retirement period
r	Replacement rate in PAYG (ratio of average monthly pension to monthly gross wage earned at the last month of working life)

Note: Support ratio is computed as a number of people employed in the economy divided by the number of retired people.

Assumptions:

Base year: For purpose of this theoretical calculation it is necessary to track the changes in the support ratio. As a base year serves 2002 ($D_t = 2.8346$).

Constant arguments: Contribution rate to the PAYG system “c” is assumed to be constant during productive life and retirement period of individual. The average real wage growth “g” is assumed to be constant during productive life of individual.

Expected changes in the rate of unemployment: The number of unemployed people is counted out of the working force. The assumption is made that the working force (people ready to work, i.e. employed plus unemployed) makes up 83% (actual number in 2002) of people in productive age and will be constant until 2050.

Table 16: Expected changes in the rate of unemployment

Year	2002	2010	2020	2030	2040	2050
%	18.5	11.6	10.0	8.0	6.0	5.0

Source: Conception of the Pension Reform in the Slovak Republic, April 2003

Demography changes: Demographic Research Center in Bratislava forecasted several scenarios of demography changes in Slovakia. All of them consider possible effects of migration. Most probably, the population should be around the “middle” scenario used in this calculation. For better illustration, the calculation presents also results obtained under the demography status quo (“no-change” scenario).

Support ratio (i.e. inversed dependency ratio): Figure 3 displays expected changes in the dependency ratio for the middle demography scenario and the retirement age 62 and 65 for both genders.¹⁷ It shows dramatic upturn after 2015.¹⁸

Equations:

This calculation is an approximation to the model described at the end of Chapter 2 (DC PAYG based on the “flat-rate”). The average monthly pension of particular individual is computed as an average contribution paid into the central insurance agency during the retirement period of that individual adjusted for:

¹⁷ The calculation considers changing retirement age from 60 to 65 for both genders.

¹⁸ The calculation takes into regard also disabled people, students, people in military service and people on maternity leave who are not included in the number of employed people. The assumption is that this group makes up 13% (actual number in 2002) of people in productive age and will be constant until 2050. The data is also adjusted for expected changes in the unemployment.

1. Wage ratio (W/W_a) - ratio of the wage that this individual has earned during his productive life to the average wage in the economy in respective period
2. Change in the support ratio (D/D_t) – support ratio at the time of retirement over the present support ratio (in 2002)
3. Ratio of the working life to the retirement period (S_t/R_t)

Equation 8: Pension in PAYG

$$R = \left[\left((W_a * c * 12) * (1 + g)^{S_t} * \frac{(1 + g)^{R_t} - 1}{g} \right) / R_t \right] / 12 * \frac{W}{W_a} * \frac{D}{D_t} * \frac{S_t}{R_t}$$

The replacement rate for PAYG system is computed as the ratio of average monthly pension to monthly gross wage earned at the last month of working life of individual:

Equation 9: Replacement rate in PAYG

$$r = \left(\frac{R}{W * (1 + g)^{S_t}} \right) * 100$$

4.3 Conclusions

Following tables display replacement rates under the FF and the PAYG pension systems respective to different real wage growths and real rates of return. The results have been computed for the average-wage-worker under the assumptions of 10% contribution rate, 40-year productive life, 20-year retirement period, and legal retirement age of 65 for both genders.

Table 17: Replacement rates in the FF pillar

Funded		Real Wage Growth										
	%	-5	-4	-3	-2	-1	0	1	2	3	4	5
Real Rate of Return	-5	11.18	9.08	7.50	6.30	5.36	4.63	4.04	3.57	3.19	2.87	2.61
	-4	15.82	12.67	10.32	8.54	7.18	6.12	5.29	4.62	4.09	3.65	3.29
	-3	22.56	17.82	14.30	11.67	9.68	8.14	6.95	6.01	5.26	4.65	4.15
	-2	32.39	25.22	19.97	16.07	13.14	10.91	9.19	7.86	6.80	5.95	5.27
	-1	46.75	35.93	28.06	22.28	17.97	14.72	12.24	10.33	8.84	7.65	6.71
	0	67.81	51.48	39.69	31.09	24.74	20.00	16.42	13.68	11.56	9.90	8.58
	1	98.74	74.11	56.46	43.67	34.30	27.36	22.17	18.23	15.21	12.87	11.03
	2	144.2	107.1	80.68	61.66	47.84	37.68	30.13	24.46	20.16	16.85	14.27
	3	211.0	155.3	115.8	87.49	67.09	52.20	41.23	33.05	26.89	22.19	18.58
	4	309.2	225.5	166.6	124.6	94.53	72.72	56.75	44.93	36.10	29.43	24.34
	5	453.1	328.0	240.2	178.1	133.7	101.8	78.53	61.46	48.79	39.29	32.10

Note:

While evaluating the results one has to have in mind that the real rate of return on capital under the funded system has not been adjusted for changes in employment.

Table 18: Replacement rates in the PAYG pillar

PAYG		Real Wage Growth										
	%	-5	-4	-3	-2	-1	0	1	2	3	4	5
Middle		7.08	7.71	8.41	9.20	10.08	11.07	12.19	13.45	14.87	16.48	18.30
No change		22.50	24.45	26.67	29.14	31.92	35.07	38.60	42.60	47.11	52.21	57.97
Designed		21.01	21.23	21.45	21.68	21.90	22.12	22.34	22.56	22.78	23.00	23.22

Note:

Replacement rates of the PAYG are computed after 40 years of saving, i.e. sometimes in 2042. Considerably lower replacement rates under the “middle” scenario are a result of negative demography expectations.

Conclusion 1:

The designed PAYG is more generous than the DC PAYG in all cases except for the unrealistic “no change” scenario of demography development. This is due to the fact, that the formula used for pension calculation under the designed PAYG does not reflect demography changes. As a consequence the designed PAYG will be unsustainable if the negative demography expectations will come true.

Figure 6 displays the performance of the FF pillar, the designed PAYG and the DC PAYG pillars (“middle” scenario of demography changes). It displays relationship between real wage growth and replacement rate. Performance of the funded pillar is tested at the same rate of net appreciation and real wage growth.

Conclusion 2:

The designed PAYG outperforms the funded pillar up to the 1% growth of real wage and appreciation. The opposite holds for the higher growth rates. The DC PAYG offers lower replacement rates at all levels of real wage growth and appreciation. The “Aaron-Samuelson condition” indicates that the difference in pension under the same rate of return on capital “a” and real wage growth “g” may be explained by change in the labor force. Hence, lower pension under the DC PAYG reflects the negative change in labor force what is in line with the actual expectations of the Demographic Research Center in Slovakia.

Figure 7 shows the performance of the funded system and the DC PAYG “no-change” scenario with legal retirement age of 60 and 65. As before, the performance is tested at the same rate of net appreciation and real wage growth, but results for the PAYG have been computed under constant 15% unemployment rate.

Conclusion 3:

The replacement rates in the DC PAYG/65 “no-change” scenario are significantly higher than in the funded system. According to the “Aaron-Samuelson condition” this might be explained by the increase of labor force after prolonging the legal retirement age from the average 55 years for women and 60 years for men to 65 years for both genders. Almost identical curves of the funded system and the DC PAYG/60 “no-change” scenario indicate that if the employment does not change in the economy and the net appreciation equals the real wage growth, both systems provide for almost the same pension.

Summary

This paper evaluates the pension reform proposal in Slovakia according to these criteria: (1) motivation of people to pay social contributions and to secure their living standard in the retirement age, (2) transition costs (3) guarantees of financial stability and (4) providing the adequate pensions (in terms of replacement rate).

Motivation

The DB PAYG before the reform almost deterred the link between income and pension. This had negative impact on motivation to pay the social security contributions and on the financial balance of the PAYG. The reform strengthens the link between work (income) and reward (pension). Together with the introduction of funded system that is purely DC this has positive impact on motivation.

Stability & Financial sustainability

If the expectations of the Demographic Research Center will come true, Slovakia will face demography crises and negative change in its labor force mainly after 2015. The PAYG will not be able to meet its promises, because its pension formula does not reflect changes in the employment and is too generous. This would require another reform - either parametric with further prolonging of retirement age and/or change of the pension formula, or systemic with the introduction of the DC/NDC PAYG. In both cases only the introduction of automatic stabilizers will secure system's long-term financial stability. However, any kind of PAYG remains sensitive to demography changes. Any country facing demography crisis can avoid possible downturn in the rate of return of its pension system only if it introduces the FF pillar and exports capital to the economy with stable or positive demography changes. In Slovakia, the restriction that binds at least 50% of the investment portfolio to Slovak securities limits this key advantage and will have to be reconsidered. Nevertheless, as the labor market determines pensions in the PAYG and the capital market development is crucial for the FF system, a combination of both enables to diversify risk between two more or less independent factors and thus to increase the overall system's stability.

Transition costs

Creation of the second pillar causes high transition costs appearing in several on-coming decades. These costs depend positively on the contribution rate for the funded pillar and on the number of people switching. With 9% contribution rate, Slovakia will have the biggest FF pillar in Europe and one of the biggest in the world. Until 2015, almost all transition costs should be covered from the PAYG savings generated mainly thanks to the prolonged retirement age. However, these savings would not be sufficient in case of massive switching. In the long run, even after prolonging the retirement age up to 65 years for both genders there will be a gap in the PAYG financial balance after 2030. This will be a combined result of demography crisis and high transition costs appearing due to the FF pillar introduction. It will have to be covered from other sources - mainly privatization revenues, state budget and loans.

Replacement rates

The PAYG replacement rates depend mainly on the real wage growth and the demography changes (i.e. labor market). The FF replacement rates depend mainly on the net asset appreciation (i.e. capital market). If labor force remains constant (for example thanks to the immigration) and the net appreciation equals the real wage growth, both systems provide for almost the same pension. With higher real wage

growth, the PAYG offers higher pensions and on contrary, higher asset appreciation speaks in favor of the FF. Expecting the real convergence INEKO assumes that the real wage growth in Slovakia will accelerate after the country's accession into the EU. This might make it more advantageous to stay in the PAYG for people with less than 15-20 years before retirement. In addition, the real returns of both pillars have to be adjusted for the costs of administration that are everywhere higher for private than for public pension plans, and are particularly high in case of private individual accounts.

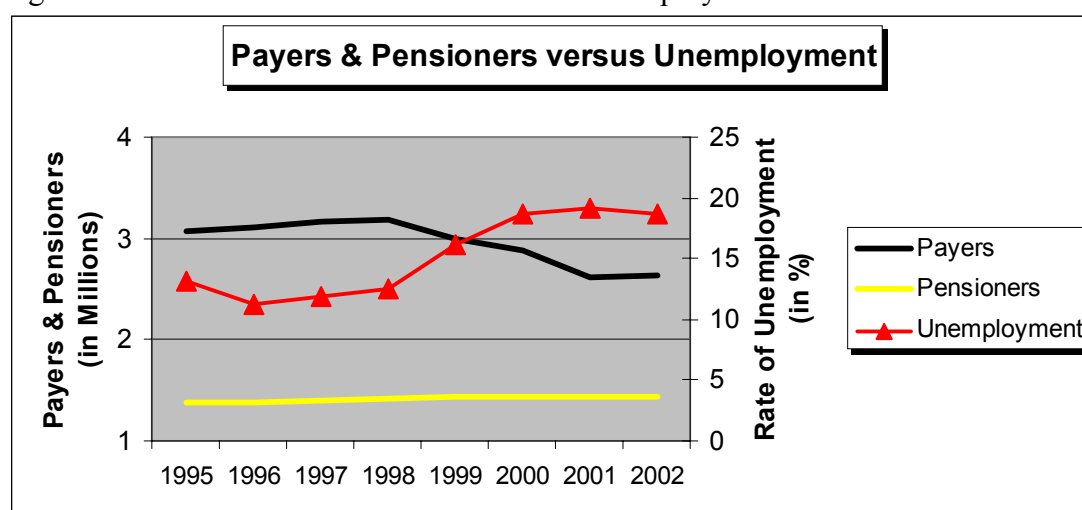
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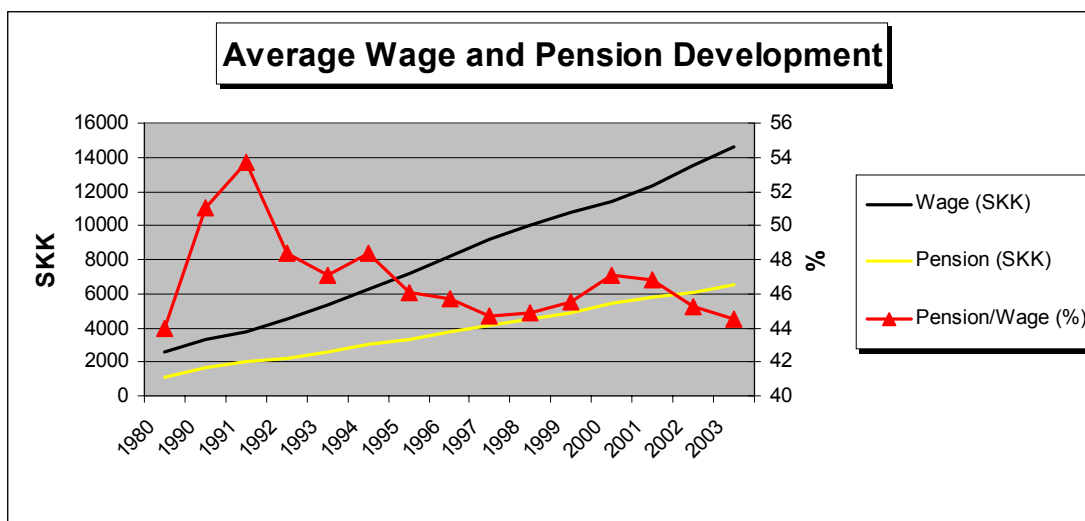
FIGURES:

Figure 1: Contributors & beneficiaries versus unemployment rate in Slovakia



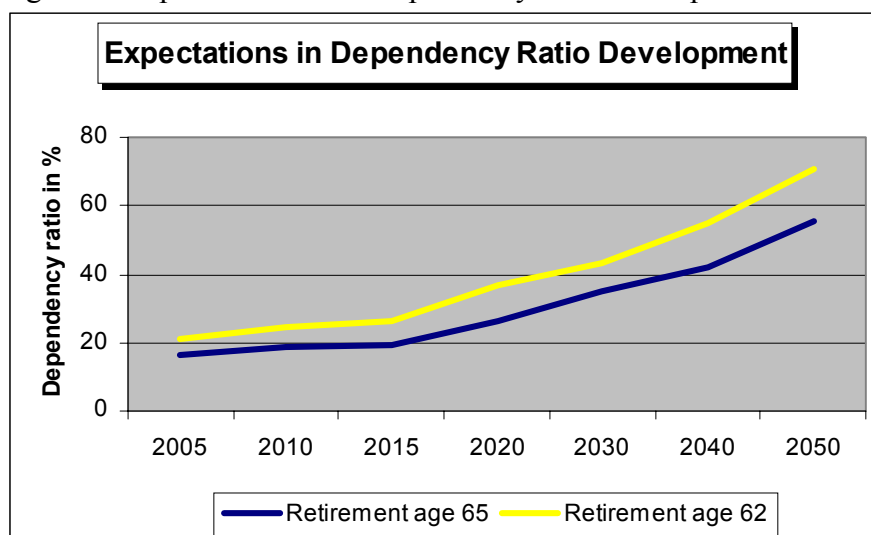
Source: Social Insurance Agency (Payers & Pensioners), Statistical Office of the SR (Rate of Unemployment)

Figure 2: Development of average wages and average pensions in Slovakia



Source: Social Insurance Agency, Statistical Office of the SR

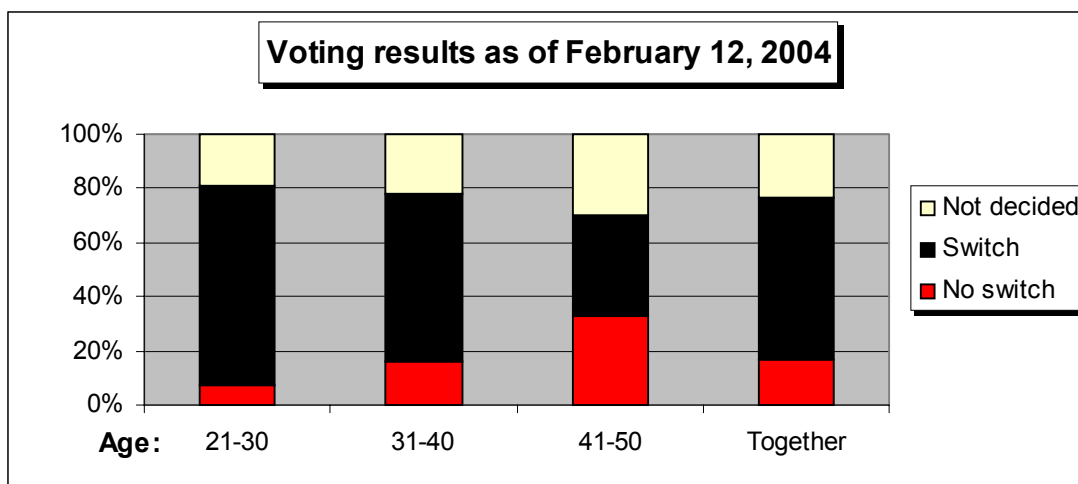
Figure 3: Expectations of the dependency ratio development in Slovakia



Source: Demographic Research Centre in the SR

Note: Dependency ratio equals the number of people above the retirement age divided by the number of people between 18 and retirement age. The expectations correspond to the most probable “middle scenario” of demography development.

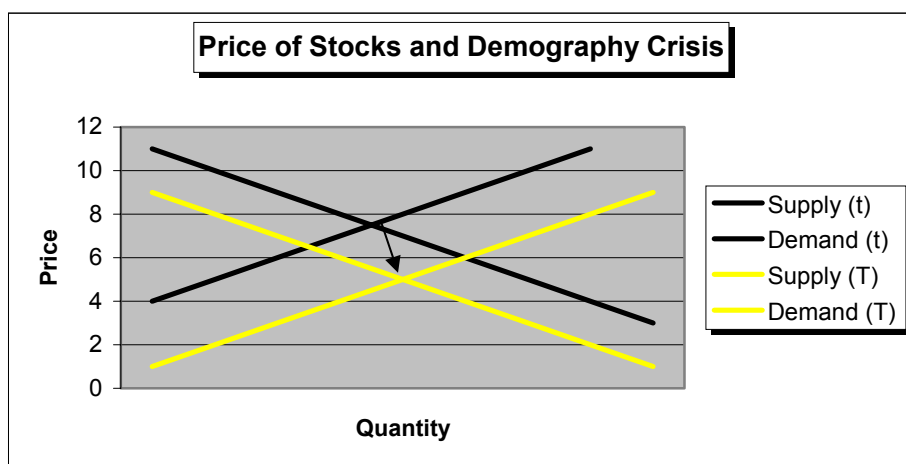
Figure 4: Research on peoples' willingness to switch for the second FF pillar



Source: INEKO

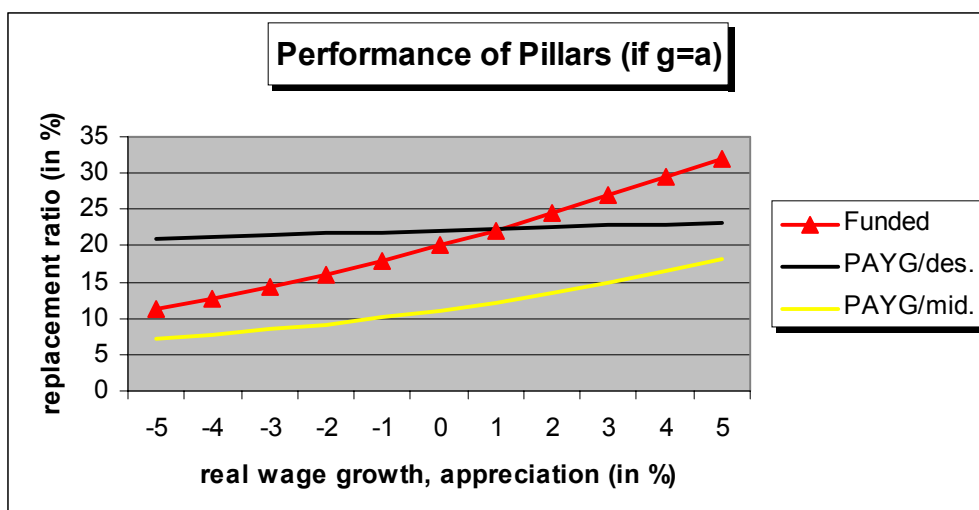
Note: Research was taken on the INEKO website since May 2003 until February 2004 on the sample of 912 people.

Figure 5: Influence of demography crisis on capital market (stock prices)



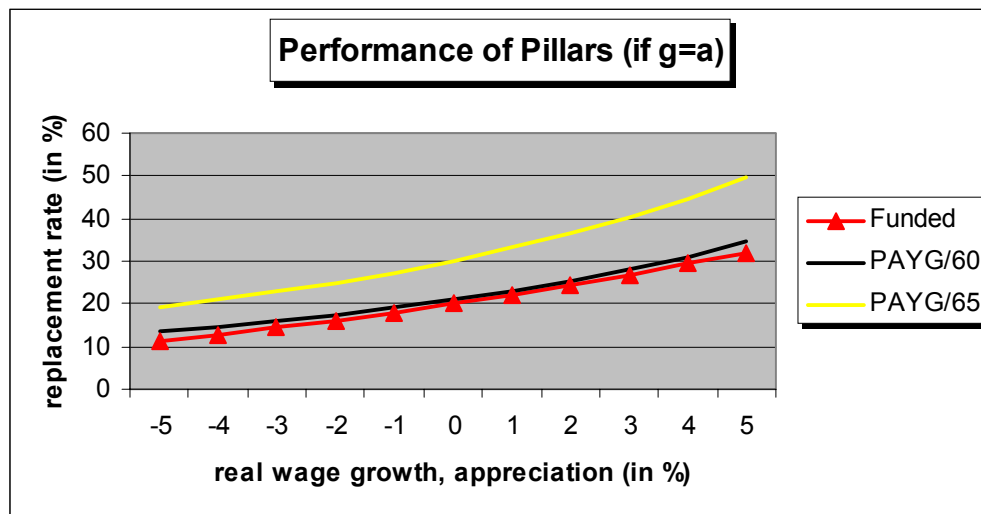
Source: INEKO

Figure 6: Performance of FF and PAYG (designed, middle scenario) pillars



Source: INEKO

Figure 7: Performance of the FF and the PAYG (“no-change” scenario)



Source: INEKO